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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/702,413	11/05/2003	Boris Yokhin	4350-4004	8334
27123	7590	08/25/2005		
MORGAN & FINNEGAN, L.L.P. 3 WORLD FINANCIAL CENTER NEW YORK, NY 10281-2101			EXAMINER THOMAS, COURTNEY D	
			ART UNIT 2882	PAPER NUMBER
DATE MAILED: 08/25/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/702,413	Applicant(s) YOKHIN, BORIS	
	Examiner Courtney Thomas	Art Unit 2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 November 2003.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-15, 18-26, 29-37 and 40-50 is/are rejected.
- 7) ☒ Claim(s) 4, 5, 16, 17, 27, 28, 38 and 39 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>06/18/04; 07/07/04</u> | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION*****Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 6-15, 18-26, 29-37 and 40-50 rejected under 35 U.S.C. 103(a) as being unpatentable over Janik (U.S. Patent 6,711,232) in view of Hossain et al. (U.S. Patent 6,005,915).

3.

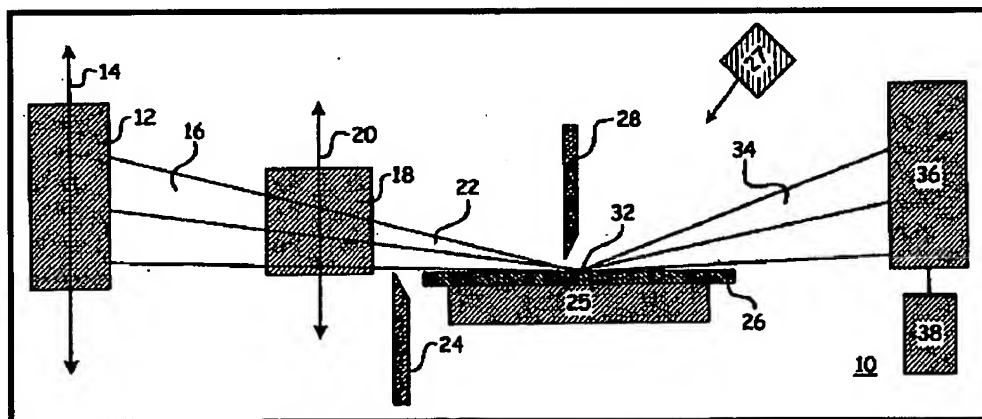
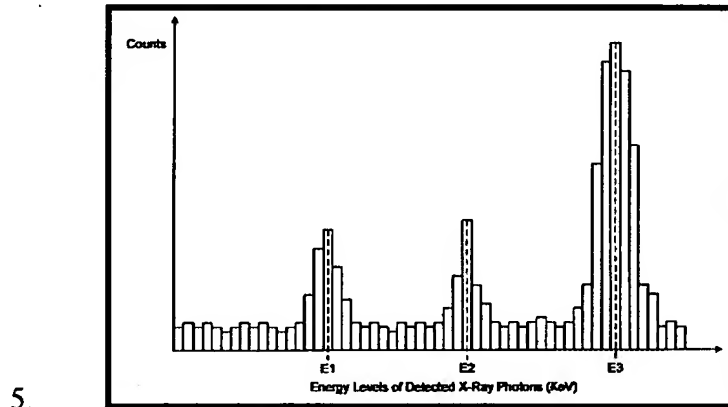


Figure 3 – X-ray Inspection Apparatus – U.S. patent 6,711,232 to Janik

4. As per claims 1, 14, 25 and 35, Janik discloses a method (and apparatus) for inspecting a sample comprising: a) irradiating a sample (26) with a polychromatic source (12-column 3, lines 50-53) of X-rays (22) comprising X-ray photons having a range of representative photon energies and b) receiving the X-rays (34) scattered from the sample at a plurality of scattering angles (column 6, lines 56-67; column 8, lines 8-12) using one or more sensors (36). Examiner notes: analyzer element 38 represents a processor of signal output received from sensors (36) -

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see also column 6, lines 56-67). Janik does not explicitly disclose a method comprising analyzing output signals based on photon energies so as to determine a scattering profile of the sample at a selected photon energy within the range.



**Fig. 5 –X-ray photon counts at selected energy levels - U.S. Patent 6,005,915 to Hossain et al.**

6. Hossain et al. disclose a method (and apparatus) for inspecting a sample comprising analyzing output signals based on photon energies so as to determine a scattering profile of a sample at a selected photon energy within the range (see Fig. 5 above). Hossain et al. teach that such a method enables fast, non-contact, non-destructive and inexpensive determination of topological defects on an object of interest (Abstract; column 5, lines 22-53).

7. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method (and apparatus) of Janik such that it incorporated the step of analyzing output signals based on photon energies so as to determine a scattering profile of a sample at a selected photon energy within the range. One would have been motivated to make such a modification for the purpose of providing fast, non-contact, non-destructive and inexpensive determination of topological defects on an object of interest, as suggested by Hossain et al. (Abstract; column 4, lines 52-57; column 5, lines 22-53).

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8. **As per claims 2, 15, 26 and 36**, Janik as modified above, disclose a method (and apparatus) wherein irradiating the sample comprises collimating the beam of X-rays (see Fig. 3 above).
9. **As per claims 3 and 37**, Janik as modified above, disclose a method (and apparatus) wherein analyzing output signals comprises the scattering profile at selected first and second photon energies within the range (see Janik: column 6, lines 56-67; column 8, lines 8-12; Hossain et al.: Abstract; column 5, lines 22-53).
10. **As per claims 6-13, 18-24, 29-34 and 40-46**, Janik as modified above, disclose a method (and apparatus) wherein receiving X-rays comprises receiving scattered X-rays using an array of detector elements, arranged so that each of the elements receives the scattered X-rays at one of the plurality of scattering angles (see Fig. 3 above); wherein analyzing the output signals comprises counting X-ray photons that are incident on the detector elements at the selected photon energy (see Fig. 5 above); wherein counting the X-ray photons comprises processing pulses that are generated by each of the detector elements due to the scattered X-rays that are incident thereon (see Fig. 5, above) and further comprising receiving the X-rays reflected from the sample over multiple elevation angles using the array of detector elements, and analyzing the output signals based on the photon energies so as to determine a reflectometric profile of the sample at the selected photon energy.
11. **As per claims 47-50**, Janik as modified above, do not explicitly disclose an apparatus comprising a deposition station or production station adapted to receive a semiconductor wafer.
12. It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the apparatus of Janik, such that it incorporated a

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deposition station and/or production station adapted to receive a semiconductor wafer. One would have been motivated to make such a modification for the purpose of enabling in-situ inspection of wafers during production processes as suggested by Hossain et al. (see column 2, lines 40-44).

***Allowable Subject Matter***

13. Claims 4-5, 16-17, 27-28, and 38-39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. **As per claims 4 and 16 and dependent claims 5 and 17 respectively**, the examiner found no reference in the prior art that disclosed or made obvious a method, comprising the step, wherein irradiating a sample comprises generating a beam using an X-ray tube having an anode comprising an anode material, wherein first and second photon energies correspond to first and second emission lines of the anode material.

15. **As per claims 27 and 38 and dependent claims 28 and 39 respectively**, the examiner found no reference in the prior art that disclosed or made obvious an apparatus, wherein the radiation source comprises an X-ray tube having an anode comprising an anode material, wherein first and second photon energies correspond to first and second atomic emission lines of the anode material.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Courtney Thomas whose telephone number is (571) 272-2496. The examiner can normally be reached on M - F (9 am - 5 pm).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272 2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink that reads "Courtney Thomas". The signature is written in a cursive, flowing style.

Courtney Thomas  
Examiner  
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